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10/696,755

10/29/2003

Jeffrey A. LeBlanc

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INTELLECTUAL PROPERTY DEPARTMENT
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EXAMINER

CHEN, TIANJIE

ART UNIT

PAPER NUMBER

2627

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,755

Applicant(s)

LEBLANC, JEFFRY A.

Examiner

Tianjie Chen

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2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
4a) Of the above claim(s) 11 and 20-23 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1, 2, 4, 6-10, 12, 16, 17 and 19 is/are rejected.
7) ☒ Claim(s) 3, 5, 13-15 and 18 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Non-Final Rejection

Election/Restrictions

1. Applicant's election without traverse of Group I claims 1-10 and 12-19 in the reply filed on 03/23/2006 is acknowledged.

Claim Objections

2. Claims 7 and 18 are objected to because of the following informalities:

- In claim 7, line 3; “;” should be changed to --.--.
- In claim 18, line 3; --in-- should be inserted after “formed.”

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4, and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichiyama (JP 2000-014079A) in view of Lee et al (US 6,339,515).

Claim 1, Ichiyama shows a motor in Fig. 2 including: a stationary shaft 3; a hub 7 including a rotor, wherein the hub is rotatable about the central axis with respect to the shaft; a thrust plate 4 ([0021] line 3) coupled to the shaft; and a counter plate 21 coupled to the hub 7 and having the shaft extending therethrough, the counter plate and the thrust plate defining at least a portion of a fluid dynamic bearing 10a ([0025] line 1).

Ichiyama does not specifically name a capillary seal.

However, Lee et al shows a fluid bearing and teaches that the bearing fluid will form capillary seals at one or more ends of the shaft that are exposed to ambient air pressure (Column 1, lines 43-45). One of ordinary skill in the art would have been motivated by Lee et al's teaching to expect that there is a capillary seal between the counter plate 21 and shaft 3, which shows that at least a portion of the counter plate and the thrust plate form an axially oriented capillary seal therebetween.

Claim 4, Ichiyama further shows that the thrust plate further includes: an upper surface at least partially facing the counter plate; a lower surface at least partially facing the hub, and a passage 6 formed between the upper and lower surfaces and at least partially aligning with the capillary seal ([0021, lines 10-11).

Claim 6, Ichiyama further shows that at least the thrust plate 4 further includes: a plurality of pumping grooves (herringbone slot [0027], lines 5) formed therein inherently radially outward of the passage for the lubricant to flow.

Claim 7, Ichiyama further shows in Fig. 2 an asymmetric seal including a grooved pumping seal near a lower end of the shaft and the capillary seal near an upper end of the shaft.

Claim 8, Ichiyama further shows that the thrust plate 4 further includes: a cylindrical portion coupled to the shaft; and a flange extending radially outward from the cylindrical portion.

Claim 9, Ichiyama further shows that the flange of the thrust plate further includes: an upper surface at least radially facing a bottom surface of the counter plate; and a lower surface facing a working surface of the hub.

Claim 10, Ichiyama shows a hydrodynamic bearing defined between the hub and the shaft.

4. Claims 2, 12, 16, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al (US 6,249,400) in view of Ichiyama and Lee et al.

Claim 2, Hong et al shows an apparatus in Fig. 2 having a base 110 and a motor installed in, wherein a first end of the stationary shaft coupled thereto, and a cover plate coupled to base and having a second end of the stationary shaft coupled thereto. Hong et al does not show the detail of the motor.

Ichiyama and Lee et al shows a motor as described above and teaches that this motor has the advantage of easily and firmly sticking a sealing member and a sleeve member to each other and solving the problem of the productivity drop (See ABSTRACT). One of ordinary skill in the art would have been motivated to apply this motor into Hong et al's device to solve the problem of problem as addressed above.

Claim 12, the above constructed includes a motor including; a base: a cover coupled to the base; a stationary shaft coupled to the base at a first end and coupled to the cover at a second end; a hub including a rotor, wherein the hub is rotatable about the central axis with respect to the shaft; a fluid dynamic bearing defined the hub with the shaft; a thrust plate coupled to the shaft; a counter plate coupled to the hub; a divergent capillary seal defined between the thrust plate and the counter plate: and a stator coaxial with the shaft for rotating the hub relative to the shaft.

Claim 16, Ichiyama further shows that the thrust plate 4 further includes: a cylindrical portion coupled to the shaft 3; and a flange extending radially outward from the cylindrical portion.

Claim 17, Ichiyama further shows that the flange includes: of the thrust plate further an upper surface at least partially facing a bottom surface of the counter plate; a lower surface facing a working surface of the hub; and a passage formed between the upper surface and lower surface; the passage at least partially aligning with the capillary seal.

Claim 19, Ichiyama further shows that at least the thrust plate 4 further includes: a plurality of pumping grooves (herringbone slot [0027], lines 5) formed therein inherently radially outward of the passage for the lubricant to flow.

Allowable Subject Matter

5. Claims 3, 5, 13-15, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- Claim 3, as the closest reference on record Ichiyama (JP 2000-014079A) shows a thrust plate and counter plate, **but fails to show** that the thrust plate further includes an outer surface, facing and diverging from an inner surface of the counter plate.
- Claims 5 and 18, as the closest reference on record Ichiyama (JP 2000-014079A) shows a hub, **but fails to show** that the hub further includes: a fluid re-circulation hole formed therein at least partially aligning with the passage formed in the thrust plate.
- Claim 13, as the closest reference on record Ichiyama (JP 2000-014079A) shows a thrust plate and counter plate, **but fails to show** that the capillary seal

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is defined between an outer surface of the thrust plate and an inner surface of the counter plate.

- Applicant asserts that in his invention, a divergent capillary seal is formed between the thrust plate and counter plate thereby allowing the shaft to extend beyond the counter plate and be coupled to the cover at a second end, thereby providing increase motor stiffness over conventional designs (Specification, [0011]).

Conclusion


6. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is 571-272-7570. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


TIANJIE CHEN
PRIMARY EXAMINER